

AUTOMATED BALLISTIC CABINET (ABC) SDD



**Contract Performance Report
Detailed Analysis
February 2007**

Analysis Example - Introduction

- **The purpose of this example is to provide a “real-life” application of the guidance found in the CEVM Analysis Toolkit.**
- **This example is for reference purposes only and should be tailored to meet specific Program Office requirements.**
- **All references to dates, numbers, program performance, etc. are fictitious.**

Milestone Status

<u>Event Status</u>	Date	
• EVMS Certification	May 08	Scheduled
• CDR Systems Review	26 Jan- 27 Jan 08*	In Progress
• SRA Completed	18 Dec 06	
• IBR #2	28 Nov 06	Completed

***The incremental CDR schedule has been revised. The Systems CDR was originally scheduled for 23 Jul 07 and has slipped to 27 Jan 08.**

Variance & Performance Overview

CPI/ SPI Summary Indicator: **RED**

Cum CPI:

↓.89

(\$1,569K)

2-Month CPI*

.89

Cum SPI:

↓.78

(\$5,183K)

2-month SPI*

.88

EV % Complete:

34.6%

Schedule % Complete:

53%**

*Feb is the second month of the quarterly Award Fee period.

** Program projected end date Sept 2010

Current Cost Variances

February 2007 Data Current Cost Drivers

CWBS No.	Description	Cum CV	Cum
		\$K	CPI
1.5.20	Stator	(\$657)	0.34
1.8.20	PCS Inverter	(\$565)	0.85
2.7.05	LCS Software	(\$250)	0.34

CWBS 1.5.20 Stator- Material (resin) was paid for in full however only one third was received. The cost variance will be resolved when the prepaid resin has been received. There is no impact to the program.

CWBS 1.8.20 PCS Inverter- Several invoices hit the ledger at the same time. Cost variance will decrease as the budget is aligned with the updated schedule. There will be no cost impact to the program.

CWBS 2.7.05 LCS Software - due to the redesign activities by FMI, required to support the Health Monitoring and Maintenance effort

Analysis Note→ Variances for the Stator and PCS Inverter are caused by poor EV methodologies vice performance. These distortions directly affect the quality of management data (CPRs). We have asked DCMA to work with the contractor to resolve.

Cumulative Cost Variances

CWBS No.	Description	Cum CV \$K	Cum CPI
1.8.20	PCS Inverter	(\$425)	0.34
1.5.20	Stator	(\$257)	0.95
1.17.04	PPIS Inverter	(\$101)	0.05

- **CWBS 1.8.20 PCS Inverter and CWBS 1.5.20 Stator cost variance explanations are consistent with Current cost variances.**
- **CWBS 1.17.04 PPIS Inverter** Technical problems with the PPIS field control portion of the A003 CDRL caused the cost variance. The task continues to be challenging. Cost is at risk of further degradation.

Cumulative Schedule Variances

February 2007 Data Cumulative Schedule Drivers

CWBS No.	Description	Cum SV \$K	Cum SPI
1.5.20	Stator	(\$1,425)	0.25
1.8.20	Inverter	(\$882)	0.78
1.30.15	Components	(\$151)	0.98

- **CWBS 1.5.20 Stator** **CWBS 1.8.20 Inverter**, **CWBS 1.30.15 Components** Unfavorable variances are due to efforts planned against the Mar 07 Baseline for CDR. This SV will carry over until CDR completion, at which time performance will be claimed.

Current Schedule Variances

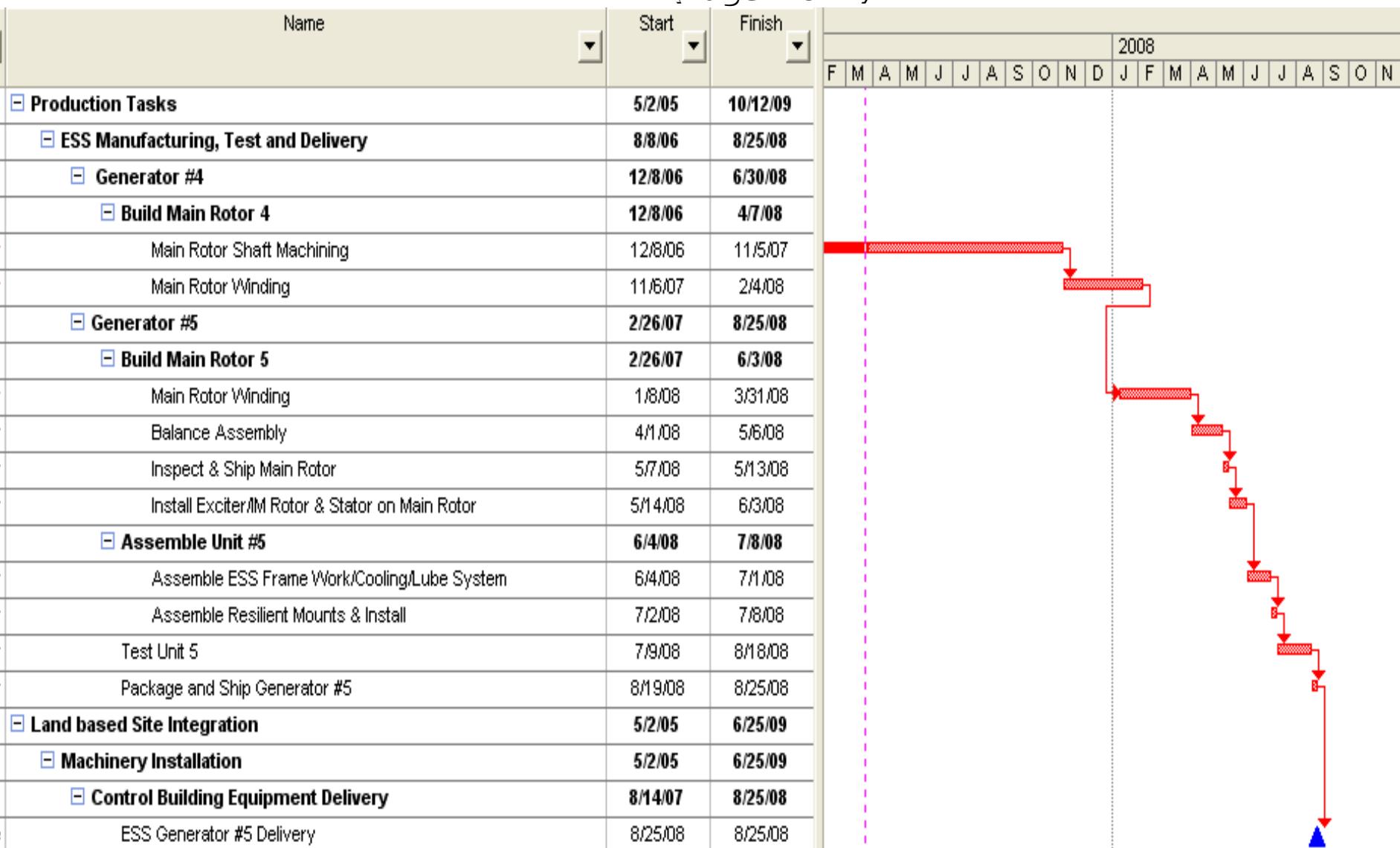
February 2007 Data Current Schedule Drivers

CWBS No.	Description	Cum SV \$K	Cum SPI
1.12.03	Generator	(\$957)	0.95
1.5.20	Stator	(\$501)	0.05
1.30.15	Components	(\$441)	0.55

CWBS 1.12.03 Generator CWBS 1.5.20 Stator, CWBS 1.13.15 Components
Unfavorable variances are due to efforts planned against the Jul 07 Baseline for CDR. This SV will carry over until CDR completion, at which time performance will be claimed

Program Critical Path to LRIP

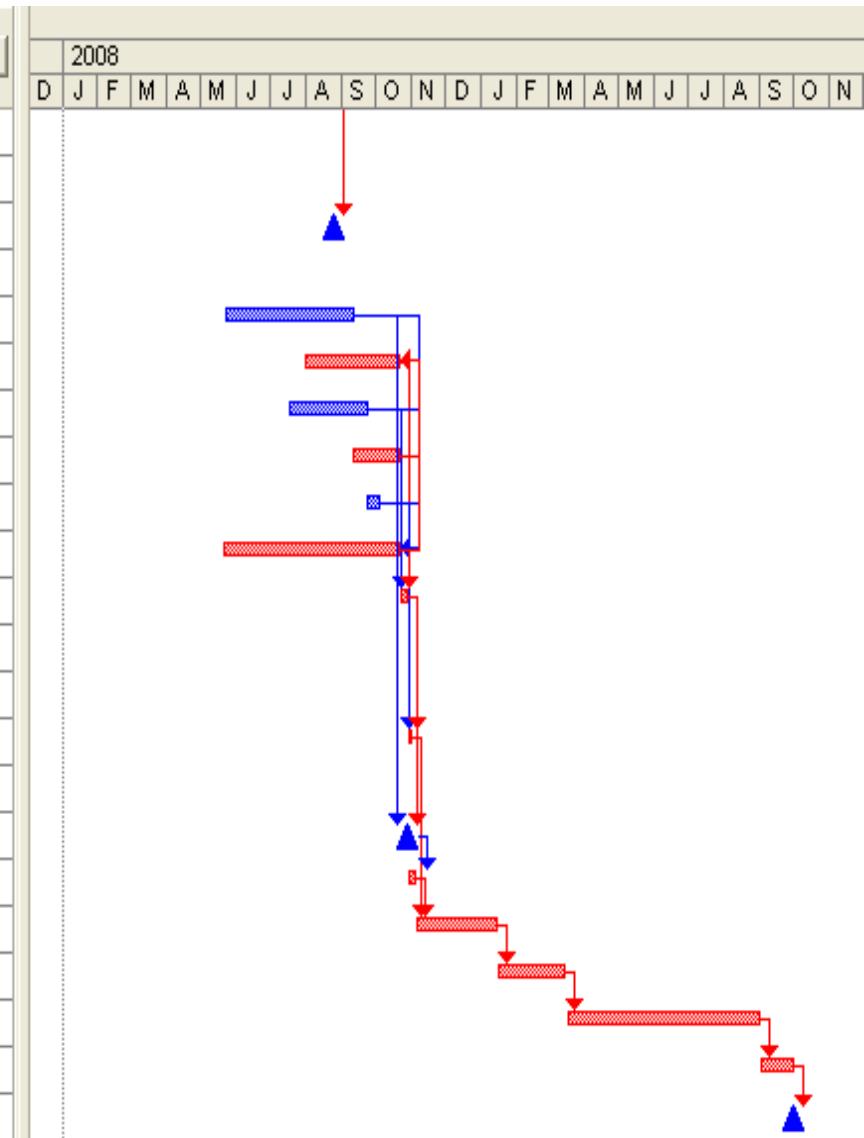
(Page 1 of 2)



Program Critical Path to LRIP

(Page 2 of 2)

Name	Start	Finish
Machinery Installation		
Control Building Equipment Delivery	5/2/05	6/25/09
ESS Generator #5 Delivery	8/14/07	8/25/08
System Integration and Commissioning Tests	4/9/08	1/12/09
Power Train 1 Commissioning	5/21/08	9/11/08
LMS Commissioning	7/30/08	10/21/08
Power Train 2	7/16/08	9/23/08
Power Train 3	9/10/08	10/21/08
Power Train 4 Commission	9/22/08	10/3/08
LCS Commissioning Tests	5/19/08	10/21/08
Four Motor Commissioning	10/22/08	10/28/08
Integrated & System Tests	5/1/06	9/30/09
Navy System Performance Specifications - Integrated Tests	4/28/08	10/31/08
Cyclic Loading	10/29/08	10/31/08
Navy System Performance Specification - Full System Tests	10/29/08	9/30/09
MS7 - TRR2 Test (Phase 3)	10/28/08	10/28/08
TRR2 Closeout	10/29/08	11/4/08
Navy System Performance Specification - System Functional Demo	11/5/08	1/14/09
Aircraft Compatibility Test	1/15/09	3/13/09
Repeating cycles with deadloads and aircraft	3/16/09	9/1/09
Prepare Navy System Performance Specification - Full System Tests Repor	9/2/09	9/30/09
MS8 - LRIP PRR \ SDD Complete	9/30/09	9/30/09



Schedule Metrics

AIR - 4.2.3 Standard Schedule Instruction Metric Goals	Legend		
	<5%		
	5% to 20%		
	>20%		
Program:	Program Name		
Next Milestone:	Milestone		
Milestone Baseline Date:	September 2009		
Metrics For:	Total Project	DEC06	
IMS Date:	DEC06		
Schedule Status Date:			
Total Tasks	6376		
% Complete	55%		
% Incomplete	45%		
Tasks Not Started	2310		
Tasks in Progress	558		
% w/ WBS Reference	18%		
Baseline Rate	3514		
% Missing Logic	2%		
% Constrained	3%		
% High Float	95%		
Average Float (Tasks >44wd)	287		
% High Duration (RW)	30%		
Average Duration (RW)	265		
% Tasks Missed (Cumulative)	0%		

- High float is due to the SDD schedule primarily in a manufacturing phase and Planning Packages. The nature of a manufacturing schedule results in high float, as these components being manufactured are in a waiting period until assembly. The schedule is being further analyzed to ensure there are no other contributors. Currently, the high float issue will not be mitigated. [This float is acceptable and should not impact the program end date.](#)

- Duration was calculated on open tasks.

- There are currently no missed tasks in this submission due to the OTB.

Integrated Baseline Review #2

Update

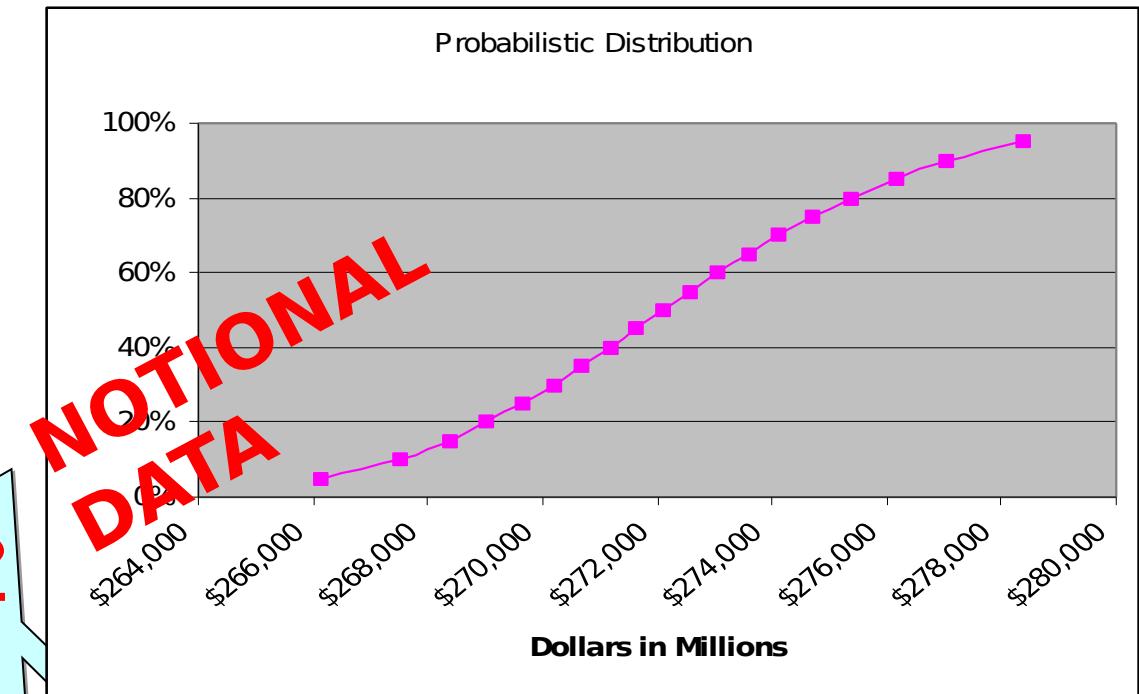
- 92 Discrepancy Reports (DRs) generated
- 9 closed
- 83 remain open
 - Cost, Schedule and Technical risks were captured in the EAC from the open DR's.

Evaluation of remaining DR's is ongoing. Determination of which DR's will need resubmission to XYZ and which will be transferred to DCMA surveillance.

EAC @Risk Results (Probabilistic Distribution)

Mode
5%
10%
15%
20%
25%
30%
35%
40%
45%
50%
55%
60%
65%
70%
75%
80%
85%
90%
95%

\$	254,031
\$	266,134
\$	267,535
\$	268,366
\$	269,019
\$	269,643
\$	270,193
\$	270,693
\$	271,187
\$	271,644
\$	272,111
\$	272,574
\$	273,053
\$	273,587
\$	274,133
\$	274,690
\$	275,200
\$	276,150
\$	277,018
\$	278,392



- A 3-pt, bottoms up estimate was developed at the 3rd WBS level. The 3-point estimate was the input for the @RISK model. The output generated an S curve and a probabilistic distribution shown above. There is a 75% confidence level that the Cost at Completion will be \$274.7M or less.

Estimate at Complete Statistical Status

- Estimate At Complete (EAC)
 - The EAC was updated Feb 07. There is 10% MR that is included in this estimate.

- Statistical Status:

Cumulative CPI x SPI*
\$295,000K

Cumulative CPI*
\$275,000K

TCPI (EAC)

.25

Cumulative CPI

.52

Contractor's Latest Revised Estimate

- **Variance at Completion**

TAB	\$200,000K
LRE	\$225,000K
VAC	(\$25,000K)

- **Best Case, Most Likely, Worst Case LRE**

Reporting Period	Latest Revised Estimate	Best Case Estimate	Most Likely Estimate	Worst Case Estimate
February 2007	\$ 225,000	\$ 218,000	\$ 225,000	\$ 245,000
January 2007	\$ 220,000	\$ 215,000	\$ 220,000	\$ 235,000

There is a disparity between the contractors LRE and the Gov't EAC.

- The EAC included a 5 month schedule slip resulting from the Schedule Risk Analysis
 - Additional technical risks and underestimated efforts that were discovered during the IBR
 - Contractors LRE is carrying a 5.2% of Work Remaining vs. the recommended 10% for Management Reserve that the EAC has included.

Data Quality Assessment

- Systems Rating: **RED**

Cost Performance Report/ Integrated Master Schedule

- Issue: The contractor is currently not EVMS Certified, this has been an ongoing issue since Program inception Dec 05.
- Concerns/ Mitigation: A certification review is scheduled for May 08.
- Update from previous reporting period- EVMS Certification remains on schedule
- Issue: The Dekker Trakker EV system that is currently being used by XYZ to measure EV, has proven to be unreliable.
- Concerns/ Mitigation XYZ is planning on converting to MPM software, to measure EV. This conversion is slated to be implemented for the Jun 07 reporting period. There will be minimal affect to the normal course of business.
- Update from previous reporting period- Transition to MPM remains behind schedule
- Issue: Used primarily by the XYZ as a means for reporting progress and not as a management tool
- Concerns/ Mitigation: Unfavorable cost and schedule make it difficult to fully utilize EV data to manage the program.
- Update from previous reporting period- No change

Data Quality Assessment (Con't)

- **Issue:** December, January and now February (not yet submitted) CPR's were unreasonably late.
- **Concerns/ Mitigation:** Contractor is having difficulty using EV as a tool and government analyst is at a handicap when analyzing and forecasting with obsolete data.
- **Update from previous reporting period-** No change

- **Issue:** Format 5 Analyses rationale continues to be deficient. Additional explanations are continuously requested to complete EV analysis.
- **Concerns/ Mitigation:** Reviewed deficiencies with the Divisional EV counterpart, who has committed to improving the quality of the submissions to reduce additional effort needed for clarification of variances.

Resources

- **Issue:** The Lead Earned Value person retired Sep 06 and has not yet been replaced. (Divisional person is currently maintaining the EV responsibilities)
- **Concerns/ Mitigation:** An offer was put out week ending 20 Feb. Potential hire has experience in MPM and may be able to ramp up in a reasonable timeframe. The concern is that there is no other potential candidates being taken into consideration.
- **Update from previous reporting period-** Cost person accepted the position and has been brought on board.



Back-Up Slides

Example

Format Analysis

Data Accuracy: All calculations were verified as correct.

Data Consistency: There appears to be data consistency throughout all 5 formats.

Validity: The February submission of Format 5 continues to improve. However, additional explanations were requested to complete the Feb 07 analysis. XYZ agreed to improve the quality of rationale in Format 5 for follow-on submissions.

Contract Background

- Contract Award September 2005
- Contract Completion September 2010
- Contract No. N00019-04-C-9999
- Type: Cost Plus Award Fee \$100,001K*
 - Cost \$90,000K
 - Award Fee \$10,001K
- Prime Contractor: XYZ Incorporated
- Major Subcontractors:
 - Sub A: \$21,000 **
 - Sub B: \$19,000K **
- The ABC Program includes the equipment (hardware/software), data, services, and facilities required to develop and produce an Automated Ballistic Cabinet.

* Based on contract modification dated Jan 2007.

** Consistent with ABC SDD Final Cost Proposal dated Mar 2001.

Management Reserve

- Balance (Dec 2006) - \$100K
- Monthly Activity - \$2K
- Balance (Jan 2007) - \$98K
 - Work Remaining as of Feb 07 = \$25,000K
 - MR in regards to Budgeted Cost Work Remaining < 1%

10% of the remaining budget is normally recommended



Total Allocated Budget

- TAB (Feb 07) - \$100,001K
- Monthly Activity -\$0K
- TAB (Jan 2007) - \$100,001K

Example

Undistributed Budget

- **Balance (Jan 07) - \$0**
- **Monthly Activity - \$0**
- **Balance (Feb 07) - \$0**

Example

Authorized Unpriced Work

- Balance (Jan 07) - \$79K
- Monthly Activity - \$0K
- Balance (Feb 2007) - \$79K

Example

Integrated Baseline Review (IBR)

#2

Ratings

TECHNICAL -

MEDIUM

- Major effort within the statement of work not covered in the Technical Plan.
- Lack of adequate definition & identification of task in baseline.
- Effects of re-work not considered in the Technical Plan.

SCHEDULE -

MEDIUM

- Aggressive schedule; no allowance for schedule slippage or re-work.
- Some contract work scope not represented in the baseline.

COST -

HIGH

- Exceeds budgetary constraints.
- Likely to cause a cost increase of more than 75%.
- Inadequate MR.

RESOURCES -

LOW

- Resources inadequate to support task planning within the project schedule.

IBR Continued

Overall Assessment -

HIGH

- Although improvements are noted, particularly in the IMS, many issues are still apparent. (see Program Level Risk - Technical, Schedule, & Resources).
- The Government did not individually assess CAMs due to inconsistent depth of questioning during interviews as a result of the IBR.
- The Government saw similar issues across most CAMs. CAM understanding & knowledge of EVM varied. Frustration with tool issues is high for most CAMs.

Rating Rationale

- There are significant documented EVM issues (e.g. EV methods, missing scope, incorrect time phasing of budgets, cost / schedule integration, baseline maintenance, etc.).
- Potential OTB Baseline request WILL change again.
 - LRE Total based on ABC PM directed target vice cost and schedule or technical performance.
 - Many instances of need to shift budget out (e.g. Mod 3 Delivery Schedule Impact Risk).
- New tool increases program risk (e.g. SAP, possible shift from MPM later in contract).
- Timeliness and Accuracy of reporting continues to be an issue (Oct submittal last to be submitted on time).
- GA is still not NOT CERTIFIED.

Integrated Baseline Review (IBR) #1

- **IBR Status update- CLOSED**
 - IBR was conducted November 2005. The Navy had concerns with Program Schedule and budget data provided. XYZ was encouraged to re-evaluate data to be reviewed at a Follow-up IBR held during November 2006. Final IBR ratings* were based on final submission of data in November 2006 and submitted to contractor.
- **Status of Concerned Area Reports**
 - DCMA conducts monthly meetings with XYZ personnel to ensure monitored issues continue to be mitigated.
- **Final Program Ratings***
 - Scope = Yellow
 - Schedule = Red
 - Resources = Red
 - Earned Value Methods = Yellow

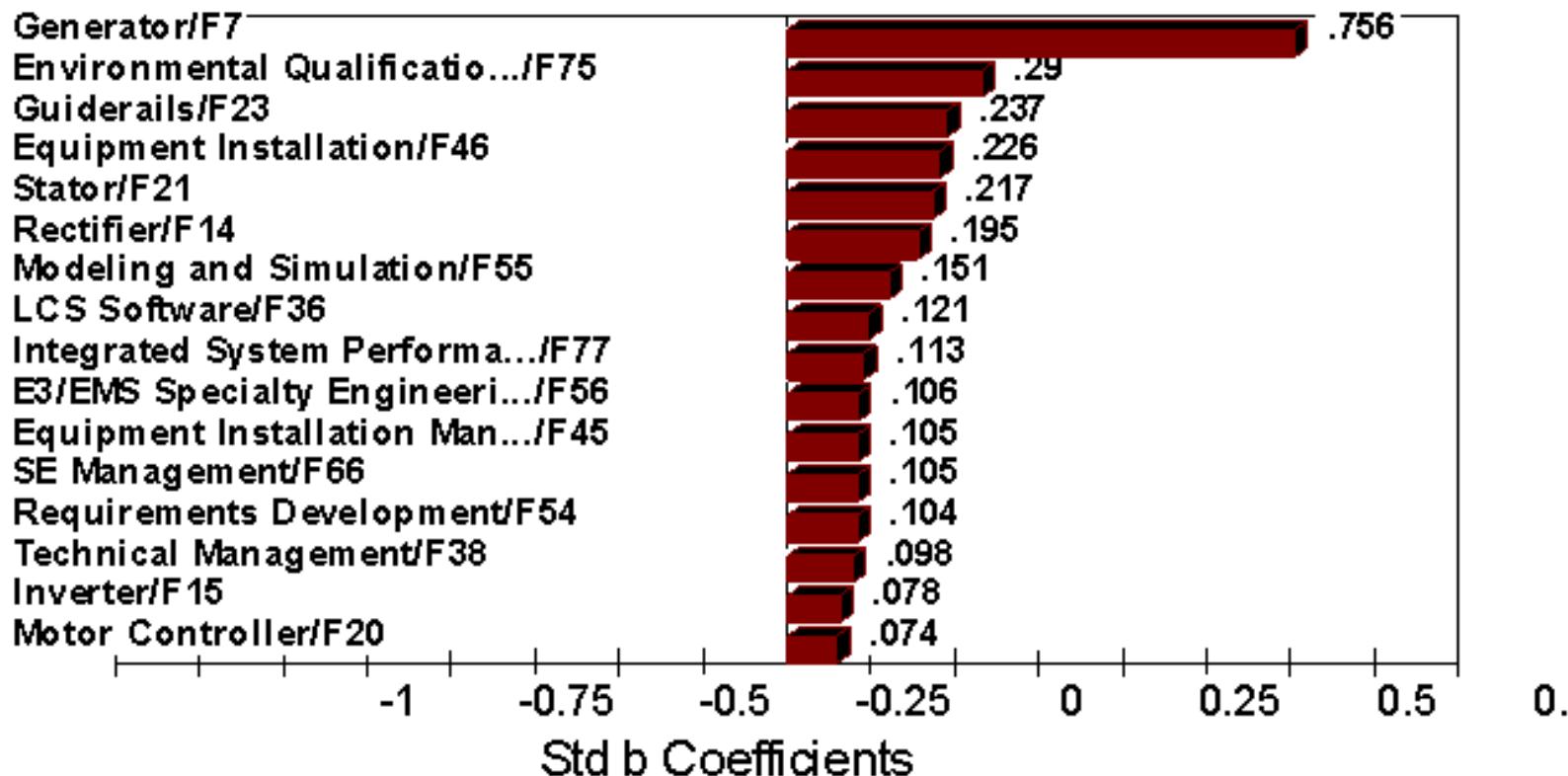
EAC Methods

- Integrated Baseline Review (IBR) conducted Nov 06
 - 25 CAM's interviewed with IPT leads at XYZ.
 - 86 Discrepancy Reports were generated.
 - Scope, schedule and cost issues were integrated into the EAC.
- Schedule Risk Assessment (SRA) conducted Dec 06
 - Identified critical path and near critical paths for evaluation using the Risk Plus model.
 - CAM interviews at XYZ.
 - Output of SRA identified Best Case, Most Likely and Worst Case slips in Critical Design Review, Technical Readiness Review, & Systems Development & Design completion dates. These dates have been integrated into the EAC.

Tornado Graph

(Sensitivity Analysis)

Regression Sensitivity for /F88



Acronyms

- **IBR** - Integrated Baseline Review
- **CPR** - Cost Performance Report (submitted monthly)
- **IMS** - Integrated Master Schedule (submitted quarterly)
- **TAB** - Total Allocated Budget
- **CBB** - Contract Budget Base
- **CLRE** - Contractor Latest Revised Estimate (Contractor LRE)
- **CV/SV** - Cost/Schedule Variances
- **CPI/SPI** - Cost/Schedule Performance Indices
- **PMB** - Performance Measurement Baseline
- **VAC** - Variance at Completion
- **MR** - Management Reserve
- **CFSR** - Contractor Funds Status Report (submitted quarterly)
- **UB** - Undistributed Budget